

ENDANGERED SPECIES

Technical Bulletin

Department of Interior, Fish and Wildlife Service
Washington, D. C. 20240

Black-footed Ferret Recovery Effort Progresses Toward Reintroduction

Many encouraging events have occurred since our last update on the black-footed ferret recovery program (see *Bulletin* Vol. XIV, No. 7). Efforts of the Fish and Wildlife Service, Wyoming Game and Fish Department, other Federal, State, and Native American agencies, and private groups to restore the Endangered black-footed ferret (*Mustela nigripes*) in the wild are gathering steam. Captive breeding, research, and investigations of possible reintroduction sites are proceeding in a number of areas. As a result of these recovery activities, the Service now anticipates that black-footed ferrets will be reintroduced into the wild in the fall of 1991.

Captive Breeding

All known black-footed ferrets are now in captivity. The world's black-footed ferret population reached 180 animals this fall, up from 118 animals in 1989, through captive breeding efforts at the Sybille Wildlife Research and Conservation Unit near Wheatland, Wyoming, the National Zoological Park's Conservation and Research Center at Front Royal, Virginia, and the Henry Doorly Zoo in Omaha, Nebraska. A total of 63 kits were added to the three captive populations, of which 50 were added to the Sybille population, 2 to the Omaha population, and 11 to the Front Royal population. The total captive population is rapidly approaching the level in the recovery plan when ferrets can begin to be reintroduced into the wild.



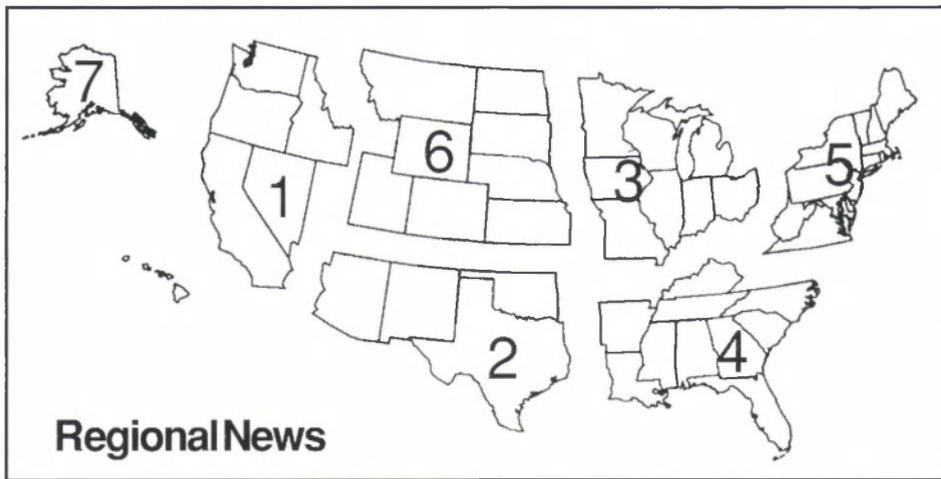
photo by Dean Biggins

The last known population of black-footed ferrets (Mustela nigripes) in the wild was discovered in 1981 in a white-tailed prairie dog (Cynomys leucurus) complex near Meteetse, Wyoming. In 1986, after disease struck the colony, the last survivors were taken for captive breeding. The entire captive population of 180 ferrets (fall 1990) descends from 18 of the Meteetse animals.

At the Sybille Unit, several other noteworthy events have been recorded in the captive breeding effort. Siberian polecats (*Mustela eversmanni*) played an important role in the survival of several black-footed ferret kits. In 1989 and 1990, surrogate polecat mothers, bred at the same time as the ferrets, nursed the ferret kits when the black-footed ferret mothers failed to lactate. In 1990, for the first time at Sybille, a black-footed ferret kit successfully nursed from a black-footed ferret that was not its mother. Older female ferrets that failed to breed and viable females that refused to accept males were also artificially inseminated in 1990, but this effort was unsuccessful.

The Henry Doorly Zoo had a successful breeding season in 1990, unlike 1989 when the ferrets did not whelp as expected. Successful breeding resulted from a better understanding of the life and reproductive cycles of these animals, the introduction of new and better diets (including the addition of vitamin E), and the application of new techniques, including light-cycle manipulation to induce early estrus in black-footed ferret females. Also in 1990, two black-footed ferrets at the zoo were successfully subjected to root canal surgery after breaking the tips off their canine teeth.

Two more facilities are now partici-
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Regional News

Regional endangered species staffers have reported the following news:

Region 1 - The Fish and Wildlife Service's Olympia, Washington, Field

Station staff met in late November with Fort Lewis Military Reservation biologists and foresters to discuss the possible designation of the Reserva-

tion as a Habitat Conservation Area for the northern spotted owl (*Strix occidentalis caurina*). This action was recommended in the Interagency Scientific Committee's 1990 report, "A Conservation Strategy for the Northern Spotted Owl," popularly known as the "Jack Ward Thomas Report" (see *Bulletin* Vol. XV, No. 7). The Reservation could provide a key link, connecting suitable spotted owl habitat between Washington's Cascades physiographic province and the Olympic Peninsula. The Service has offered to assist the Army in conducting habitat inventories and owl surveys.

* * *

The Boise, Idaho, Field Station is providing technical assistance to nature film producer Jim Dutcher, who plans to produce a feature film on gray wolves (*Canis lupus*) for the ABC television network. The film is scheduled for broadcast in 1994. Mr. Dutcher's film should aid wolf recovery by providing accurate information to millions of television viewers.

* * *

In November and December, biologists from the Service's Sacramento, California, Field Station, San Francisco Bay National Wildlife Refuge, and California Department of Fish and Game conducted a winter population census of the Endangered California clapper rail (*Rallus longirostris obsoletus*) in major marshes of South San Francisco Bay. Although California clapper rail populations still appear stable along the western shoreline, with red foxes (*Vulpes vulpes*) apparently not yet established there, populations along the eastern shoreline within the Refuge continue to decline. No more than 30 California clapper rails were observed in Dumbarton Point Marsh and 50 were observed in Mowry Slough. Historically, these marshes respectively supported over 200 and over 150 rails.

* * *

On December 11, the U.S. Forest Service, Idaho Department of Lands, and Washington-Idaho Forest Indus-

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Northern Spotted Owl Recovery Team is Announced

Secretary of the Interior Manuel Lujan has announced the creation of a 16-member Northern Spotted Owl Recovery Team, which has the challenging task of writing a plan to secure the owl's long-term future. The Team includes representatives of the affected States, all involved Federal land management agencies, and academia. In his directive to the Team, Secretary Lujan said, "The development of a recovery plan for the northern spotted owl may be the most important effort of its kind since the passage of the Endangered Species Act."

The northern spotted owl (*Strix occidentalis caurina*) was listed on June 26, 1990, as Threatened (see *Bulletin* Vol. XV, No. 7). Under the Act, the Secretary of the Interior has the responsibility to develop a plan for its recovery. As the first step in this process, Secretary Lujan named Marvin Plenert, the U.S. Fish and Wildlife Service's Portland Regional Director, to serve as Team Leader and Donald

Knowles, Deputy Under Secretary, as Team Coordinator (*Bulletin* Vol. XV, No. 11). The Team will be under the authority of the Secretary's Office.

The newly announced Team members are:

- Martha Pagel (Governor's Representative, State of Oregon)
- Christine Sproul (Governor's Representative, State of California)
- Richard Nafziger (Governor's Representative, State of Washington)
- John Tappeiner (Silviculturalist & Forest Ecologist, Oregon State University)
- Ralph Gutierrez (Wildlife Biologist, Humboldt State University, California)
- John Fay (Biologist, Division of Endangered Species, U.S. Fish and Wildlife Service)
- Jonathan Bart (Wildlife Biologist, U.S. Fish and Wildlife Service)
- Robert Anthony (Wildlife Biologist, U.S. Fish and Wildlife Service)
- Kent Mays (Program Manager

for the Northern Spotted Owl, U.S. Forest Service)

- Richard Holthausen (Forest & Wildlife Biologist, U.S. Forest Service)
- John Beuter (Deputy Assistant Secretary for Natural Resources and the Environment, Department of Agriculture)
- Melvin Berg (Forester, Bureau of Land Management)
- Wayne Elmore (Wildlife & Fisheries Biologist, Bureau of Land Management)
- Edward Starkey (Research Biologist, National Park Service)
- Kenneth Lathrop (Forester, Bureau of Indian Affairs)
- Ted Heintz (Economist, Office of the Assistant Secretary for Policy, Management and Budget, Department of the Interior)

The Team should begin its work in March, and a draft recovery plan is expected by fall of 1991. Upon completion of the draft, it will be released for public comment.

Ferret Recovery Progresses

(continued from page 1)

participating in the captive breeding program, bringing the total to five. The Louisville, Kentucky, Zoological Park and Cheyenne Mountain Zoo in Colorado Springs, Colorado, received ferret breeding pairs in December 1990. (The Kentucky Fried Chicken Corporation flew the black-footed ferrets down to the Louisville Zoological Park in its corporate jet.) Another two facilities, the Phoenix, Arizona, Zoo and Toronto, Ontario, Zoo have been selected to participate in the captive breeding program and should receive breeding pairs in late 1991.

Research

A variety of black-footed ferret studies are being conducted around the country. Much of the research is focused on improving the ability of captive-reared black-footed ferrets to survive in the wild when they are re-

leased. Research on disease control is taking place in all of the captive breeding facilities. Cancer continues to be the primary medical problem with aging black-footed ferrets. Coccidiosis, a disease caused by a parasitic protozoan that infects the inner lining of the digestive tract, has caused the deaths of several kits in the past and is being studied so it can be controlled (but not totally eradicated). Black-footed ferrets need to be exposed to some level of the disease to build up the natural immunity necessary to survive any outbreak of coccidiosis once they are reintroduced into the wild.

At the Sybille Unit, Fish and Wildlife Service and Wyoming Game and Fish Department-sponsored researchers are conducting studies on predator avoidance, hunting-prey behavior, and imprinting of different types of diets for captive-reared black-footed ferrets. Results of these investigations are ex-

pected to yield important information for training black-footed ferrets and designing cages to stimulate hunting instincts. To assist the work being done at the Sybille Unit, one full-time veterinary technician and a doctoral candidate researching black-footed ferret behavior, sponsored by the Service, have been assigned to work with the Wyoming Game and Fish Department.

The Service and the National Fish and Wildlife Foundation have sponsored a study at the University of Wyoming's Department of Veterinary Sciences, where a canine distemper vaccine is being tested on Siberian polecats with very promising results. Two black-footed ferrets were inoculated with a modified live virus vaccine in early January 1991 to test its safety and effectiveness. Seven more ferrets will be inoculated with the vaccine in the near future.

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Ferret Recovery Progresses

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Black-footed ferrets prey almost exclusively on prairie dogs. In the fall of 1989, the Service sponsored a Prairie Dog Ecosystem Workshop at Estes Park, Colorado. This workshop brought together about 25 experts and scientists knowledgeable in the soil, range, food chain, and disease relationships of prairie dogs. They met to identify management problems in prairie dog ecosystems and examine how these problems could affect black-footed ferret reintroduction efforts. The biologists discussed such topics as prairie dog diseases (including sylvatic plague, a flea-carried virus that is deadly to prairie dogs), the effects of cattle grazing on the prairie dog ecosystem (and vice versa), and the effects of recreational shooting of prairie dogs on the ferret's prey base. (The workshop proceedings eventually will be published by the Service and the Wyoming Game and Fish Department.) A brochure designed to educate people on the values of prairie dog ecosystems subsequently was prepared by the Service and distributed to people living within the historical range of the black-footed ferret.

Studies on predator diseases are being conducted at probable reintroduction sites in South Dakota in cooperation with the State of South Dakota, National Park Service, and the Forest Service. The Fish and Wildlife Service and Bureau of Land Management are sponsoring studies on the recreational shooting of prairie dogs and its potential impact on black-footed ferret reintroduction plans. Other Service studies are gauging the socio-economic consequences and public attitudes regarding the possible reintroduction of ferrets in Montana. Within Wyoming, Chevron USA, Inc., the Wyoming Game and Fish Department, and the Service have jointly sponsored predator studies in the Shirley Basin/Medicine Bow area.

Research is also being conducted on training captive-bred ferrets for even-



Wyoming Game and Fish Department photo

The Wyoming Game and Fish Department's Sybille Wildlife Research and Conservation Education Unit near Wheatland is one of five facilities where black-footed ferrets are being bred in captivity. Two more facilities should begin participating in the program later this year.

tual release. In the fall of 1989, the first three conditioning cages for black-footed ferret "hunter training" were finished by the Wyoming Game and Fish Department at the Sybille Unit, and they have been stocked with prairie dogs. Biologists from the Service's National Ecology Research Center and the National Zoological Park are using Siberian polecats (also called steppe polecats) to study techniques for training black-footed ferrets to hunt and avoid predators. (See the Regional News in this issue for additional details.)

Preparing for Reintroduction

The process of evaluating potential reintroduction sites for black-footed ferrets has accelerated due to the success of the captive breeding program. Probably one of the highlights of 1990 was the Black-Footed Ferret Reintroduction Workshop, sponsored in March by the Wyoming Game and Fish Department and the Service in Laramie, Wyoming. About 20 biologists and researchers gathered at the

workshop to learn how to take advantage of experiences with mammalian and avian reintroductions. The participants discussed a variety of topics, including possible threats to reintroduced animals, minimum population sizes, and release techniques. Several important conclusions and recommendations came out of the workshop. For example, the participants found that most successful reintroductions use young-of-the-year rather than older animals. The participants also recommended that 50 captive animals be released in the fall of 1991, provided this release does not jeopardize the captive population.

Service biologists are establishing guidelines for removing Environmental Protection Agency rodenticide labeling restrictions on less suitable prairie dog complexes. The Service also is working with the Interstate Coordinating Committee's state working groups (which include State, Federal, and private owners of possible reintroduction sites) and other interested parties to map prairie dog towns within most of the black-footed ferret's historical range (i.e., within Colorado, Montana, North Dakota, South Dakota, Utah, Kansas, Nebraska, Arizona, and Wyoming).

Representatives of the Bureau of Indian Affairs and the Service are evaluating possible reintroduction sites on Tribal lands in Montana and South Dakota, although progress is very slow. In western New Mexico and eastern Arizona, Navajo Nation biologists are surveying and identifying sites for restoring black-footed ferret on their lands. Such reintroductions could be significant for helping to conserve the lands and cultures of Native Americans.

The Shirley Basin Reintroduction

In December 1989, the Interstate Coordinating Committee's state working groups ranked potential black-footed ferret reintroduction sites in

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Ferret Recovery Progresses

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three States. On November 20, 1990, the Service's Denver Regional Director and the Director of the Wyoming Game and Fish Department decided that the Shirley Basin in Wyoming was biologically the best and would be the first reintroduction site. This high prairie area, south of Casper, was selected because it supports a 39,000-acre (16,000-hectare) white-tailed prairie dog (*Cynomys leucurus*) complex, it contains large blocks of public land (primarily Bureau of Land Management-administered lands), and private landowners and cattle grazing interests are agreeable to the reintroduction. The Service and State of Wyoming are preparing a draft environmental assessment and manage-

ment plan for the Shirley Basin reintroduction, with Meeteetse, Wyoming, as a back-up site. (Similar documents are also being prepared for possible reintroduction sites in Montana.)

Initially, biologists are planning to release about 50 black-footed ferrets into the Shirley Basin. (The exact number and sex of the ferrets will be determined by the captive breeding population.) Successive releases will likely be necessary to establish a viable population. All of these ferrets will be marked, radio-tagged, and released in litter or social groups established in captivity to increase their chances of survival. Prior to their release in the Shirley Basin, the ferrets will be kept and fed for about 10 days near a high density prairie dog town in acclima-

tion pens with artificial burrows. Then, if all goes well, the ferrets will be allowed to move freely in and out of the pens, which can serve as shelters until the ferrets adapt to life on the outside. The radio-collared animals will be monitored until their dispersal and survival are well documented. Biologists are cautioning everyone to expect high mortality of released animals, possibly exceeding 90 percent.

If all goes according to plan, black-footed ferrets will once again be living in the wild this fall. With the cooperation and assistance of State and Federal agencies, private landowners, ranchers, corporations, zoos, Native Americans, and other interested parties, the future of the black-footed ferret recovery effort looks promising.

Regional News

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tries reached a tentative agreement to manage roads in the Grouse Creek Grizzly Bear Management Unit of the Cabinet-Yaak ecosystem. This agreement will help secure 70 square miles (180 square kilometers) of grizzly bear (*Ursus arctos horribilis*) habitat in Idaho. In this heavily roaded area, 56 locations were identified as needing access restriction gates or barricades. The agencies identified responsibilities for management of each location and agreed upon actions to place and maintain gates or barriers. Using funds provided under Section 6 of the Endangered Species Act, up to 12 gates will be installed on private or State land to aid law enforcement and help provide grizzly bear security. After the three parties sign the cooperative agreement, which should be this winter, gates and barriers will be installed in 1991 and 1992.

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The Woodland Caribou Recovery Team met in Spokane, Washington, to revise the current recovery plan for the Endangered Selkirk Mountain herd. A draft revision should be ready by the spring of 1991. Woodland cari-

bou (*Rangifer tarandus caribou*) across North America are in decline from unknown causes. Most likely, a combination of poaching, wolf/bear predation, and road building, together with the naturally low reproductive rates of caribou, are having a cumulative effect on the herds.

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Region 2 - The status of the Endangered Hualapai Mexican vole (*Microtus mexicanus hualpaiensis*) is being assessed by the Arizona Game and Fish Department under a Fish and Wildlife Service contract. The vole has been known to occur recently in four areas. However, surveys of three of the areas by the Bureau of Land Management and the Service in late September revealed no sign of voles. One of the areas (Grapevine Spring) appeared to have been destroyed by a flood earlier in 1990. The drought of 1988-1989 eliminated vegetative cover at the other two sites. The State extensively surveyed all four known areas in the fall of 1990 and evaluated other sites that once supported populations. Only one site (Pine Peak Canyon) shows signs of vole activity. Further exploration of the canyon and surrounding areas is

contemplated for this summer.

The Hualapai Mexican Vole Recovery Plan is expected to be completed this winter.

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The U.S. Forest Service, Fish and Wildlife Service, University of Arizona, Arizona Game & Fish Department, and volunteers completed the fall 1990 survey of the Endangered Mount Graham red squirrel (*Tamiasciurus hudsonicus grahamensis*) in late October. The total fall population, including juveniles, was estimated to be between 250 and 300 animals. It is difficult to tell, however, whether this represents a real increase in the squirrel's population from last year. Conifer cone crops were good this year, especially for Englemann spruce (*Picea engelmannii*), in contrast to previous years. Both adult and juvenile red squirrels were storing conifer cones in middens (i.e., food storage areas). Some animals appeared to be developing new middens, with cones being stored on the ground in small hollows, along fallen trees, and inside logs. The success of these new ventures will be examined in the spring surveys.

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Listing Proposals — December 1990

Nine species — five Idaho snails, three Florida plants, and one North Carolina plant — were proposed by the Fish and Wildlife Service during December 1990 for listing as Endangered or Threatened. If the listing proposals become final, the following taxa will receive Endangered Species Act protection.

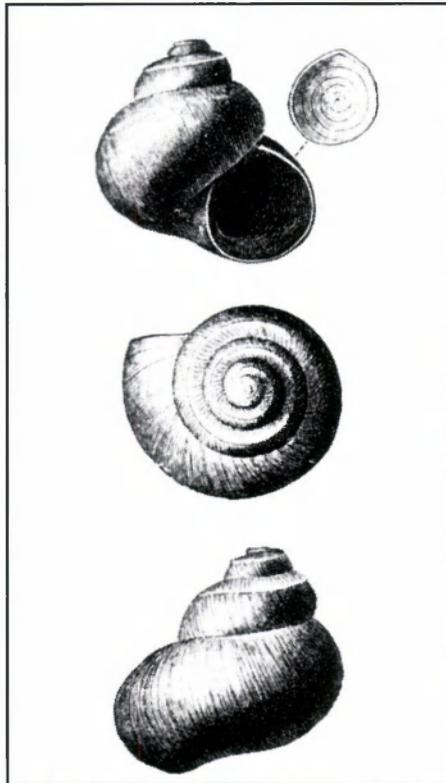
Idaho Snails

Five species of small aquatic snails restricted to the Snake River system were proposed December 18 for listing as Endangered:

- Bliss Rapids snail, an undescribed, monotypic genus in the family Hydrobiidae;
- Utah valvata snail (*Valvata utahensis*), which despite its name is now known only from Idaho;
- Snake River Physa snail (*Physa natricina*);
- Idaho springsnail (*Fontelicella idahoensis*); and
- Banbury Springs limpet, an undescribed species in the genus *Lanx*.

All five species occur only at a few sites in south-central Idaho within the main channel of the Snake River and several tributaries. None of these snails can survive in reservoirs. They apparently require clean, well-oxygenated water and a rapid, free-flowing river or large spring habitat. As reaches of the Snake River have been impounded for irrigation and hydro-power facilities, the amount of suitable habitat available for the snails has been reduced substantially. Only 11 known sites support remnant populations of one or more species.

Hydroelectric projects have been proposed for construction in several of the remaining sections of free-flowing habitat on the Snake River. If these facilities are approved and built as planned, the population of all five rare snails will be reduced, and two species — the Banbury Springs limpet and



Valvata utahensis

Snake River Physa snail — will likely become extinct. Even existing dams may be causing additional damage to the habitat by the practice of “peak loading,” which requires the artificial raising and lowering of water levels for generating power at times of peak demand. Oxygen depletion, water pollution from agricultural runoff, and competition from a recently introduced snail (*Potomapyrgus antipodarum*) are other potential threats.

Federal agencies whose activities could have an impact on the habitat of the Idaho snails include the Federal Energy Regulatory Commission, which has jurisdiction over licenses for hydroelectric projects, and the U.S. Army Corps of Engineers, which has authority under Section 404 of the Clean Water Act to regulate the filling of navigable waters and other wetlands. If the Idaho snails are listed under the Endangered Species Act, all Federal agencies will be required to ensure that their activities are not likely to jeopardize the survival of these species.

Florida Plants

Three plant species native to the Apalachicola region of the Florida panhandle were proposed by the Service for listing as Threatened (F.R. 12/18/91):

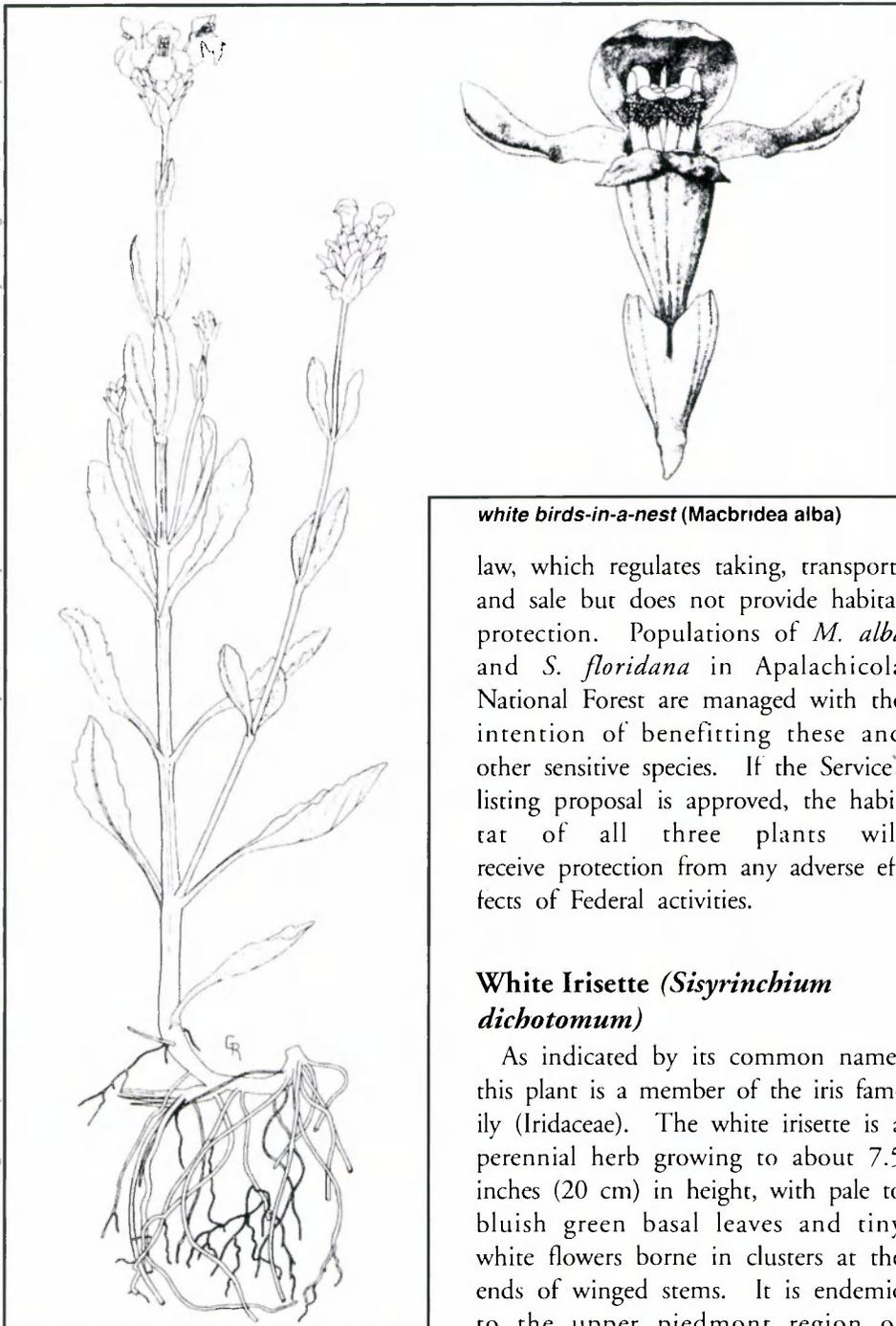
- Telephus spurge (*Euphorbia telephioides*) — An herbaceous perennial, this plant has a highly branched, bushy appearance and grows to about one foot (30 centimeters) tall. Its broad leaves are maroon at the edges. The inflorescence is a cyathium (a structure resembling a flower, containing several male flowers, each reduced to a single stamen, plus a single stalked female flower). This species is known from only 22 sites, all within 4 miles (6.4 kilometers) of the coast.

- white birds-in-a-nest (*Macbridea alba*) — This perennial, a member of the mint family (Lamiaceae), is an upright, usually single-stemmed herb that grows up to approximately one foot in height. Its large, brilliant green and white flowers resemble snapdragons and are clustered among bracts at the top of the plant. Forty-one of this species' 63 known sites are within Apalachicola National Forest.

- Florida skullcap (*Scutellaria floridana*) — Another perennial mint, *S. floridana* is sparsely branched and has short, narrow leaves with purplish tips. Its flowers are bright lavender-blue and white, and have a cap or “scutellum” on the calyx. This species is known from 11 sites, 5 of which are in the Apalachicola National Forest.

All three species are restricted to lowlands along the Gulf of Mexico coast, where they grow primarily in wet savannas, seepage bogs, and other open, poorly drained areas. Many of these native habitats are being converted to pine plantations or improved pastures. The suppression of naturally occurring wildfires also affects the sun-dependent plants by allowing the encroachment of competing vegetation. Power line rights-of-way provide

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white birds-in-a-nest (Macbridea alba)

law, which regulates taking, transport, and sale but does not provide habitat protection. Populations of *M. alba* and *S. floridana* in Apalachicola National Forest are managed with the intention of benefitting these and other sensitive species. If the Service's listing proposal is approved, the habitat of all three plants will receive protection from any adverse effects of Federal activities.

White Irisette (*Sisyrinchium dichotomum*)

As indicated by its common name, this plant is a member of the iris family (Iridaceae). The white irisette is a perennial herb growing to about 7.5 inches (20 cm) in height, with pale to bluish green basal leaves and tiny white flowers borne in clusters at the ends of winged stems. It is endemic to the upper piedmont region of North Carolina. In 1942, this species was reported to be "fairly common," but today it is known from only three locations in Polk, Henderson, and Rutherford Counties. All three populations have been at least partially damaged by residential and industrial development, road maintenance activities, suppression of natural disturbance, and exotic plants. Because of imminent threats to its survival, *S. dichotomum* has been proposed for listing as Endangered (F.R. 12/20/90).

The white irisette grows only in

clearings and along the edges of upland woods where the canopy is thin. Therefore, it depends on some form of periodic disturbance to maintain the open quality of its habitat. Some of the openings once produced by wildfires and native grazing animals are now being maintained by artificial disturbances (e.g., certain power line and road right-of-way maintenance activities). Being concentrated on such intensively managed areas, however, exposes the plants to risk from herbicides, trampling, and mowing during their reproductive cycle.

With proper management, the two populations that are located within highway rights-of-way may survive. The third, however, is in an area recently subdivided for residential development. Other threats to the white irisette include encroachment by aggressive, non-native plants such as kudzu (*Pueraria lobata*) and Japanese honeysuckle (*Lonicera japonica*).

North Carolina already lists the white irisette as endangered, but the restrictions on take and trade provided by State law do not extend to habitat. If the Service's listing proposal is approved, the species will gain protection from any adverse effects of Federal activities.

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Available Conservation Measures

Among the conservation benefits authorized for Threatened and Endangered plants and animals under the Endangered Species Act are: protection from adverse effects of Federal activities; restrictions on take and trafficking; the requirement for the Service to develop and carry out recovery plans; the authorization to seek land purchases or exchanges for important habitat; and Federal aid to State and Commonwealth conservation departments that have approved cooperative agreements with the Service. Listing also lends greater recognition to a species' precarious status, which encourages other conservation efforts by State and local agencies, independent

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Listing Proposals

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some open habitat for the plants, especially *E. telephioides*, but the use of herbicides for clearing the corridors (instead of mowing or other mechanical means) could constitute another threat. Because the entire distribution of *E. telephioides* is within 4 miles of the coast, this species also is vulnerable to habitat loss from residential and resort development.

These plants are already listed as endangered species under Florida State

Final Listing Rules Published for Three Species

During December 1990, final rules were published listing three taxa — a plant, a bird, and a mammal — as Endangered or Threatened species.

Sentry Milk-vetch (*Astragalus cremnophylax* var. *cremnophylax*)

This dwarf plant, a member of the pea family (Fabaceae), usually grows in a mat no more than 10 inches (25 centimeters) in diameter and less than 1 inch (2.5 cm) high. It produces small white or pale purple flowers. The sentry milk-vetch is endemic to a single site on the South Rim of Grand Canyon National Park, where it occurs in crevices and depressions on Kaibab limestone. The entire population consists of fewer than 500 individual plants. Park visitors walking to view the canyon rim have trampled the sentry milk-vetch and degraded its habitat, causing the population to decline. From May 1989 to May 1990, subpopulations experienced from 19 to 63 percent mortality, depending on the degree of human visitation. Although the National Park Service has rerouted foot traffic to restrict access to this site, plant vigor is so low from past trampling that the species is still in danger of extinction. The number of seedlings annually produced also seems to be small with a high mortality, possibly due to poor seed dispersal

and to hard frosts and freezes during the flowering/fruitletting period. The Fish and Wildlife Service proposed that the sentry milk-vetch be listed as Endangered in the October 18, 1989, *Federal Register* (see *Bulletin* Vol. XIV, Nos. 11-12), and the final rule was published December 5, 1990.

Golden-cheeked Warbler (*Dendroica chrysoparia*)

The golden-cheeked warbler is a small, insectivorous bird that breeds only in parts of central Texas. It has very specific ecological requirements, occurring only in mature Ashe juniper (*Juniperus ashei*) and oak woodlands. Habitat destruction is the primary reason this species is threatened. Urban development and widespread clearing of juniper for range management have occurred throughout the warbler's range. In 1990, it was estimated that no more than 263,750 acres (106,750 hectares) of suitable habitat remained.

The golden-cheeked warbler and its habitat continue to be threatened by juniper clearing and the construction of highways, water reservoirs and delivery systems, and private developments. Habitat fragmentation also may be promoting the spread of the brown-headed cowbird (*Molothrus ater*), a more adaptable bird that para-

sitizes the warbler's nests. Long-term successional changes in the forests also may be reducing the amount of suitable habitat for the warbler. If current trends continue, it is estimated that the golden-cheeked warbler population will decline more than 50 percent by the year 2000. The warbler's wintering habitat in the pine-oak forest highlands of southern Mexico, Guatemala, Honduras, and Nicaragua is also being destroyed and degraded.

The Service conducted an extensive review of the status of the golden-cheeked warbler and determined that emergency action was needed to protect the species. An emergency rule listing the species as Endangered and a proposal to provide long-term Endangered Species Act protection was published in the May 4, 1990, *Federal Register* (see *Bulletin* Vol. XV, No. 6). After considering the best scientific information available and the threats facing this species, the Service determined the species should be listed as Endangered. The final rule was published December 27, 1990. The Service found that Critical Habitat for the warbler cannot be determined at this time, but additional information on habitat requirements is being collected. Critical Habitat for the warbler must be designated by the Service

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Listing Proposals

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organizations, and concerned individuals.

Section 7 of the Act directs Federal agencies to use their legal authorities to further the purposes of the Act by carrying out conservation programs for listed species. It also requires these agencies to ensure that any actions they fund, authorize, or carry out are not likely to jeopardize the survival of any Endangered or Threatened species. If an agency finds that one of its activities may affect a listed species, it

is required to consult with the Service on ways to avoid jeopardy. For species that are proposed for listing and for which jeopardy is found, Federal agencies are required to "confer" with the Service, although the results of such a conference are not legally binding.

Additional protection is authorized by Section 9 of the Act, which makes it illegal to take, possess, transport, or engage in interstate or international trafficking in listed animals except by permit for certain conservation purposes. For plants, the rules regard-

ing "take" are different. It is unlawful to collect or maliciously damage any Endangered plant on lands under Federal jurisdiction. Removing or damaging listed plants on State and private lands in knowing violation of State law or in the course of violating a State criminal trespass law also is illegal under the Act. In addition, some States have more restrictive laws of their own specifically against the take of State or federally listed plants and animals.

Final Listings

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by May 4, 1992, unless such a designation is found not to be prudent.

Steller Sea Lion (*Eumetopias jubatus*)

On November 26, 1990, the National Marine Fisheries Service (NMFS), an agency of the U.S. Department of Commerce that has Endangered Species Act responsibility for most marine wildlife, published a finding that the Steller sea lion should be listed as Threatened. The Fish and Wildlife Service, which is responsible for maintaining the Federal List of Endangered and Threatened Wildlife and Plants, then formally added the species to the list on December 4, 1990.

The Steller sea lion ranges from Japan through the Soviet Union's Kuril Islands, the Okhotsk Sea, the

Bering Sea, the Gulf of Alaska, and along North America's west coast down to southern California. Preliminary 1990 data indicate that Alaska rookeries from the Kenai Peninsula to Kiska Island supported about 25,000 Steller sea lions, compared to about 140,000 in 1956-60, for a drop of about 82 percent. The decline has spread from the eastern Aleutian Islands, where it began in the 1970's, east to the Gulf of Alaska and west to the central Aleutian Islands and Kuril Islands. The reasons for the decline are not known but may be due to reductions in the availability of pollock and other prey species, incidental take of seals during commercial fishing operations, disturbance of rookeries and haulout sites, or a combination of factors. (Steller sea lion pups were taken commercially up through 1972, which may explain the declines in the eastern Aleutian Islands and Gulf of Alaska through the 1970's.)

In response to the decline of the Steller sea lion, NMFS took emergency action to list this species as Threatened throughout its range. A 240-day emergency rule was published in the April 5, 1990, *Federal Register* (see *Bulletin* Vol. XV, No. 5). On July 20, NMFS published a proposal to give the species long-term listing protection. The November 26 final rule contains protective measures similar to those in the emergency rule regarding the discharge of firearms, the establishment of buffer zones around 35 sea lion rookeries, and a quota for the incidental take of sea lions by commercial fishermen.

In March 1990, NMFS established a Steller sea lion recovery team, which is in the process of preparing a recovery plan and developing recommendations on necessary protective regulations. The draft recovery plan should be available for public review later this year.

Regional News

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The number one known cause of death for fledged whooping cranes (*Grus americana*) is powerline collisions. Forty percent of the known losses in the Rocky Mountain flock and 25 percent of the Canadian/U.S. flock are due to birds colliding with powerlines. Consequently, the Service began evaluating line marker devices in cooperation with utility companies in Colorado and Nebraska in 1988. The Colorado study, which is examining yellow markers that increase powerline visibility, is continuing.

The Wyoming Cooperative Fish and Wildlife Research Unit in Laramie, with the support of Service Regions 2 and 8 and utility companies, recently completed a 3-year study that examined whether or not yellow airplane marker balls on powerlines diminished collisions in Nebraska's Platte River Valley. This area is used by sandhill cranes (*Grus canadensis*) as a spring staging area and

is bordered by many high electrical transmission lines. There was no significant difference in the number of sandhill cranes flying over marked and unmarked lines. However, the collision rate on unmarked line segments was more than twice as high as on marked line segments. The birds' response to the markers indicated they saw the markers at a distance and adjusted their flight path. In contrast, birds approaching the unmarked lines more frequently flared at the last moment as they attempted to avoid the lines.

Copies of the final report on the results of the Nebraska study are available from Dr. Jim Lewis, Fish and Wildlife Service, P.O. Box 1306, Albuquerque, New Mexico 87103 (telephone: 505/766-3972; FTS 474-3972).

* * *

Region 4 - Late last summer, biologists from the Service's Asheville, North Carolina, Field Office and the Tennessee Cooperative Fishery Research Unit discovered a new popu-

lation of the Endangered little-wing pearly mussel (*Pegias fabula*) in a short reach of the Little Tennessee River in North Carolina. At the time of this discovery, the only known little-wing pearly mussel population in North Carolina had been lost. Only seven other populations of this mussel are known. Historically, the species was widespread in the Tennessee and Cumberland River Systems. However, in recent years the species' distribution has been severely reduced due to degradation of water and substrate quality. The discovery of this new population in the Little Tennessee River will assist in the species' recovery.

* * *

Region 5 - After 5 years of lobbying by a broad coalition of conservation groups, the Massachusetts Legislature enacted a strong endangered species protection law on December 17, 1990. Once the legislation is fully implemented in January 1992, Massachusetts will have one of the most

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Aleutian Canada Goose Reclassified From Endangered to Threatened

After a 22-year effort to restore the Aleutian Canada goose (*Branta canadensis leucopareia*), the Fish and Wildlife Service has determined that this subspecies is no longer in imminent danger of extinction and that enough progress has been made to reclassify the subspecies from Endangered to the less critical category of Threatened. The Service proposed the subspecies for reclassification in the September 29, 1989, *Federal Register* (see *Bulletin* Vol. XIV, Nos. 11-12), and the final rule was published December 12, 1990.

Aleutian Canada geese probably once bred on islands from the western Gulf of Alaska to the Commander and Kuril Islands of the Soviet Union. They are thought to have wintered in Japan and in North America from British Columbia to California. The decline in the subspecies' numbers and breeding range is attributed largely to predation by the arctic fox (*Alopex lagopus*), a non-native species that was introduced onto many of Alaska's Aleutian Islands years ago in an attempt to establish a fur trade. Sport hunting and loss of the goose's wintering habitat also probably contributed to the decline of the subspecies. It is generally recognized that hunting during migration and on the goose's wintering areas kept their numbers depressed.

After the Service listed the Aleutian Canada goose as Endangered in 1967, an intensive effort was launched to protect the subspecies on its breeding and wintering grounds. Even before the subspecies was listed, the Service had begun to eliminate arctic foxes from the Aleutians. The Service subsequently reintroduced geese on fox-free islands and worked with the States of California and Oregon to acquire or protect key wintering habitat. Selected areas in California were also

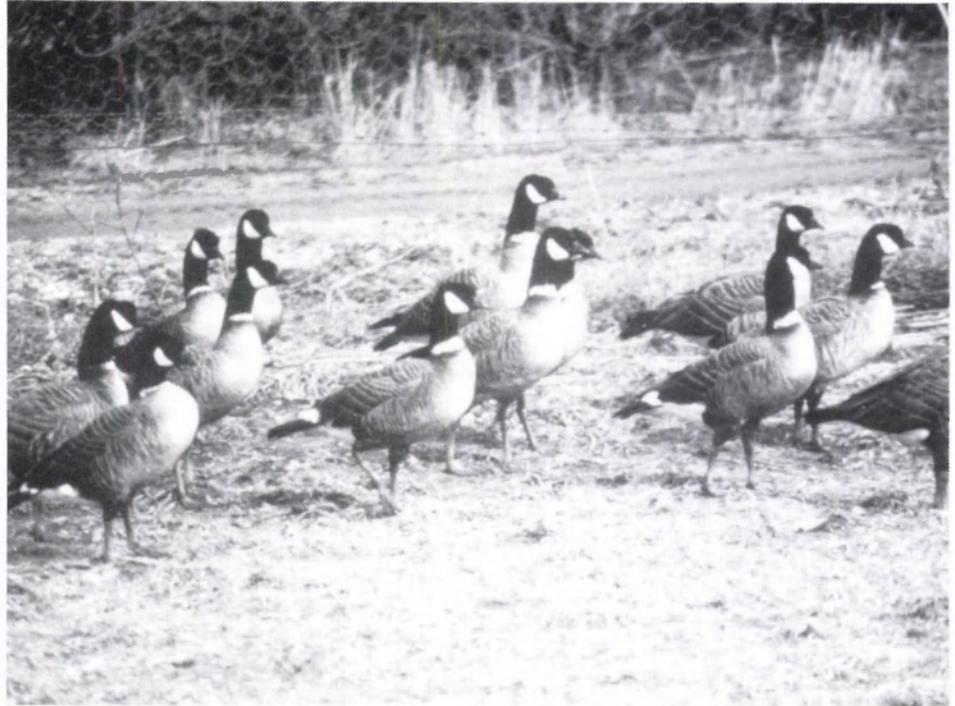


Photo by Glen Smart

The Aleutian Canada goose is the only subspecies of *Branta canadensis* whose range once included both the North American and Asian continents.

closed to hunting for all Canada geese beginning in 1975 and in Oregon in 1982. As a result of these actions, the wild population has increased an average of 16 percent annually since 1975, when there were 790 birds, and now exceeds 6,000 birds. In the U.S., Aleutian Canada geese currently nest on Buldir, Little Kiska, Agattu, Nizki, Alaid, Chagulak, and Amukta Islands in the Aleutians, and on Kiliktagik Island in the Semidi Island Group, south of the Alaska Peninsula. All of these islands are within the boundaries of the Alaska Maritime National Wildlife Refuge.

Although the Aleutian Canada goose is no longer in imminent danger of extinction, it still requires protection under the Endangered Species Act. The small, isolated breeding populations are vulnerable to storms and disease. Less than 15 percent of the habitat that was once used by nesting geese has been cleared of arctic foxes. One of the greatest threats to

the full recovery of the goose is the loss of wintering and migration habitat. Wintering habitat in California is being lost to urban development, changing agricultural practices, and pollution. The threat of large losses to disease, such as avian cholera, will also grow as increasing numbers of geese concentrate in the remaining wintering grounds.

The change in classification of the Aleutian Canada goose to Threatened does not significantly alter the protection of this species under the Endangered Species Act. Anyone taking, attempting to take, or otherwise illegally possessing an Aleutian Canada goose without a permit would be in violation of the Act. Section 7 of the Act also continues to protect this subspecies from Federal actions that could jeopardize its survival. The Service will proceed to work with Federal and State agencies and private groups to seek full recovery of the Aleutian Canada goose.

Regional News

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progressive endangered species laws in the country.

The most significant component of the new law is the protection provided to habitat for endangered species. Habitat loss is the single greatest threat to native plants and animals in Massachusetts and elsewhere. According to Henry Woolsey, Coordinator of the Division's Natural Heritage & Endangered Species Program (who has been working on this bill for 5 years), "the passage of this bill is a major milestone for wildlife conservation in the Commonwealth."

* * *

Region 6 - A bacterial disease commonly referred to as "redleg" has been confirmed as a factor in the death of at least five Endangered Wyoming toads (*Bufo hemiophrys baxteri*). This disease is considered to be stress-related. The outbreak occurred in cold weather, when the toads were going into hibernation, which is considered to be a stressful time for the toads. Biological censusing techniques, including photography, were not considered to be significant stress factors contributing to the disease. Ninety-two Wyoming toads were individually identified through photographs in 1990. The current adult population is believed to be around 100 individuals.

* * *

A Regional News item in the May 1989 *Bulletin* (Vol. XIV, No. 5) reported on a "fine example of inter-agency cooperation for protecting listed species while accommodating project goals." It described an Endangered Species Act/Section 7 consultation between the Service and the Federal Highway Administration over two Threatened plants, Mead's milkweed (*Asclepias meadii*) and the western prairie fringed orchid (*Platanthera praeclara*). Since that time, unfortunately, the consultation has turned out to be a better example of the lack of

protection afforded to listed plants that occur on private land.

The Federal Highway Administration and Kansas Department of Transportation altered the original alignment for a proposed northeast Kansas highway to avoid the 80-acre (32-hectare) Elkins Prairie, a remnant of virgin tall grass prairie known to contain both listed plants. The Douglas County Zoning Board provided additional safeguards against the threat of development along the new highway by agreeing to maintain the agricultural zoning classification of the prairie. This classification makes it impossible to commercially develop the area. Because the owner is not a crop farmer, it was believed that this action would protect the plants' habitat.

However, before dawn on Sunday, November 18, the landowner began plowing the prairie. Local environmentalists and county officials persuaded him to stop after about a third of the tract had been plowed. The county called an emergency board meeting and negotiated late into Sunday night, finally offering the landowner his originally requested \$6,000 per acre selling price for the prairie. His demands apparently increased, however, and negotiations broke down around 3:00 a.m. Monday morning. Shortly thereafter, the landowner resumed his plowing, turning under all but a small strip of the 80 acres.

This was not illegal under the Endangered Species Act. The rules for listed plants do not prohibit individuals from doing whatever they want on their land, as long as no other laws are violated. At the time the Section 7 consultation was conducted on this highway project, Elkins Prairie contained the world's largest known population of Mead's milkweed. Larger populations have since been discovered, tempering this loss somewhat. But the destruction of two populations of threatened species highlights the lack of protection provided under the Endangered Species Act for listed plants on private land.

* * *

Region 8 - The Service's National Wildlife Health Research Center in Madison, Wisconsin, has received funds to investigate the role of disease in limiting the distribution and abundance of native Hawaiian forest birds. Working with the Patuxent Wildlife Research Center, the Center will conduct integrated studies of this problem, examining free-flying birds and carcasses for the prevalence of diseases, and using sentinel birds (i.e., susceptible caged birds) to detect the presence of diseases.

* * *

Biologists from the Service's National Ecology Research Center in Fort Collins, Colorado, and the National Zoological Park in Washington, D.C., have been conducting experimental releases of Siberian polecats (*Mustela eversmanni*) for the past 2 years to test release techniques for the Endangered black-footed ferret (*Mustela nigripes*). (See the story in this issue for an update on the black-footed ferret recovery effort.) The Siberian polecat, also called the steppe polecat, is widely distributed through the grasslands of Asia, and has physical and behavioral characteristics similar to those of the black-footed ferret. In the fall of 1989, 13 captive-reared, sterile polecats were radio-tagged with newly designed transmitters and released in an area near Wheatland, Wyoming. The new radio collars, which did not accumulate mud or cause ulcerations in the polecats, were a success and will be used when black-footed ferrets are released.

In the fall of 1990, 5 wild-caught and 38 captive-reared, sterile, radio-collared Siberian polecats were released into black-tailed prairie dog (*Cynomys ludovicianus*) colonies in Colorado and Wyoming. Four test groups were released: 1) the wild-caught Siberian polecats; 2) captive-reared Siberian polecats, raised from 3 months of age in a 2,000-square-foot (190-square-meter) training enclosure

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Regional News

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containing prairie dogs and their burrows; 3) captive-reared polecats raised in a training enclosure with prairie dogs and frequent exposure to a dog (which served as a surrogate predator); and 4) captive-reared polecats raised in small cages and released gradually from the cages.

As with the 1989 release, most of the polecats released in 1990 were killed by coyotes (*Canis latrans*) or American badgers (*Taxidea taxus*). In Colorado, the predator population was about 3 times greater than in Wyoming and all of the captive-raised polecats were killed within 2 days of their release. In Wyoming, one captive-raised polecat lived over 34 days and successfully killed prey but finally died of starvation. Cage-reared polecats survived an average of less than 4 days at the Wyoming site, whereas animals raised in the training enclosures survived an average of 9 days. Only one of the cage-reared polecats immediately left the cage, and it survived for 19 days before dying of starvation. The wild-caught Siberian polecats survived longest at both sites. All of these polecats also eventually died, except for one animal that was recaptured in good condition 6 weeks after it was released. Although reintroduced black-footed ferrets may be more adept at hunting prey and avoiding predators than their Asian cousins,

Category	ENDANGERED		THREATENED		LISTED SPECIES TOTAL	SPECIES WITH PLANS
	U.S.	Foreign Only	U.S.	Foreign Only		
Mammals	54	249	8	22	333	29
Birds	72	153	12	0	237	69
Reptiles	16	58	18	14	106	25
Amphibians	6	8	5	0	19	6
Fishes	53	11	33	0	97	49
Snails	4	1	6	0	11	7
Clams	37	2	2	0	41	29
Crustaceans	8	0	2	0	10	5
Insects	11	1	9	0	21	12
Arachnids	3	0	0	0	3	0
Plants	186	1	60	2	249	120
TOTAL	450	484	155	38	1127*	351**
Total U.S. Endangered	450		(264 animals, 186 plants)			
Total U.S. Threatened	155		(95 animals, 60 plants)			
Total U.S. Listed	605		(359 animals, 246 plants)			

* Separate populations of a species that are listed both as Endangered and Threatened are tallied twice. Those species are the leopard, gray wolf, grizzly bear, bald eagle, piping plover, roseate tern, Nile crocodile, green sea turtle, and olive ridley sea turtle. For the purposes of the Endangered Species Act, the term "species" can mean a species, subspecies, or distinct vertebrate population. Several entries also represent entire genera or even families.

** There are 276 approved recovery plans. Some recovery plans cover more than one species, and a few species have separate plans covering different parts of their ranges. Recovery plans are drawn up only for listed species that occur in the United States.

Number of Cooperative Agreements signed with States and Territories: 53 fish & wildlife
39 plants

January 31, 1991

which have been bred in captivity for many generations, it does appear that the methods used to raise and release ferrets will affect their survival. Thus,

the enclosure-training facilities may play a very important role in black-footed ferret behavioral conditioning and reintroductions in the future.

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